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UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

SAN JOSE DIVISION

COREPHOTONICS, LTD.,

Plaintiff,

v.

APPLE INC.,

Defendant.

Case No. 5:17-cv-06457-LHK (lead case)
Case No. 5:18-cv-02555-LHK

APPLE'S RESPONSIVE CLAIM CONSTRUCTION BRIEF

Date: January 17, 2019
Time: 1:30 P.M.
Courtroom: 8
Judge: Hon. Lucy H. Koh

DEMAND FOR JURY TRIAL

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I. INTRODUCTION

This is an unusual case where the plaintiff-patentee, Corephotonics, seeks unduly narrow claim constructions for most of the disputed terms. Corephotonics proclaims that its claimed inventions are allegedly innovative. (Dkt. No. 96 ("Open. Br.") at 1-2.) Tellingly, however, Corephotonics asks the Court to improperly inject narrowing limitations in an apparent effort to avoid invalidating prior art. The Court should reject Corephotonics' litigation-driven proposals. Apple's proposed constructions faithfully reflect the meanings shown by the evidence, and should be adopted.

II. THE COURT SHOULD ADOPT APPLE'S PROPOSALS.

A. "total track length (TTL)" / "total length (TTL)" ('032 patent, claim 1; '712 patent, claims 1, 15, 19; '568 patent, claim 1; '291 patent, claim 6)

Corephotonics' Proposal	Apple's Proposal
length on an optical axis between the object-side surface of the first lens element and **the electronic sensor**	length on an optical axis between the object-side surface of the first lens element and **the image plane**

The parties' sole dispute is whether "total track length (TTL)" is measured with reference to an image plane, as used consistently in the specification according to its customary meaning in the art, or necessarily requires an "electronic sensor," as Corephotonics seeks to read into the claims.

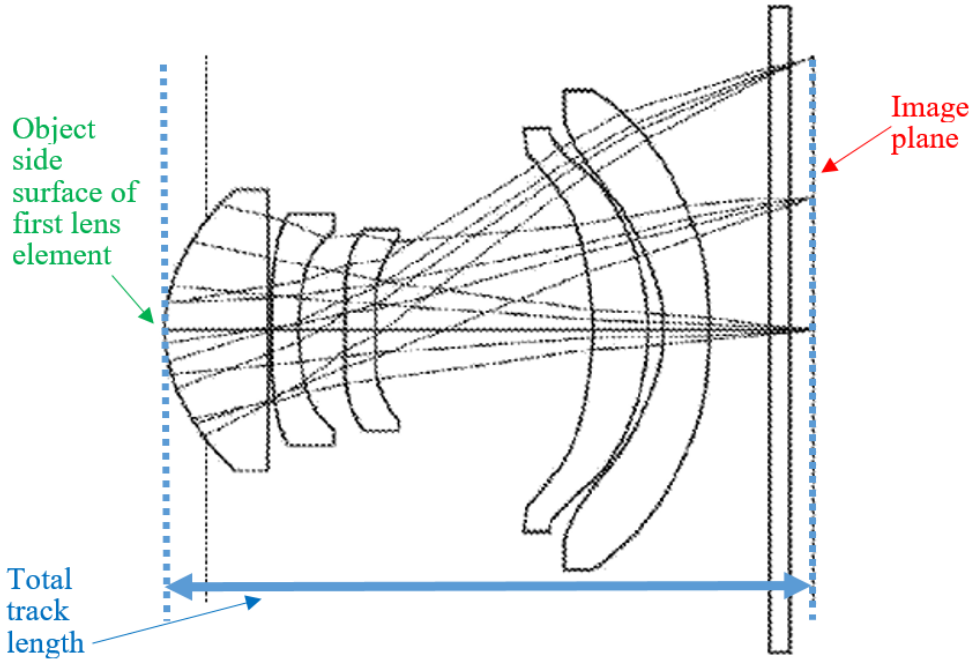
"Total track length (TTL)" is a well-known term of art in the field of optical lenses. The patents-in-suit use this term with its established customary meaning: the length on an optical axis between the object-side surface of the first lens element and the image plane. Apple's proposed construction captures that meaning. In instituting Apple's IPR petition regarding the '032 patent, the U.S. Patent and Trademark Office Patent Trial & Appeal Board ("PTAB") agreed with Apple's construction: "we agree with Petitioner that a person having ordinary skill in the art would conclude the term 'total track length (TTL)' to be 'the length of the optical axis spacing between the object-side surface of the first lens element and the image plane.'" *Apple Inc. v. Corephotonics Ltd.*, IPR 2018-01140, Institution Decision (Dkt. 97-2), at 11 (PTAB Dec. 4, 2018).

Corephotonics' construction erroneously relies on the specification's discussion of one optional, exemplary embodiment that *may* include an electronic sensor. *GE Lighting Sols., LLC v. AgiLight, Inc.*, 750 F. 3d 1304, 1309 (Fed. Cir. 2014) ("[I]t is improper to read limitations from a

preferred embodiment described in the specification—even if it is the only embodiment—into the claims absent a clear indication in the intrinsic record that the patentee intended the claims to be so limited.") (internal quotation and citation omitted). But that discussion regarding one of several embodiments does not change the term's customary meaning as known in the field and used in the patents. In fact, Corephotonics' construction would impermissibly exclude multiple preferred embodiments in the specification, which do *not* include any sensor and measure total track length (TTL) only with reference to the image plane. ('032, Figs. 2A, 3A, 5:10-11, 5:50-52, 6:27-28, 7:15-17.)[1]

1. "Total track length (TTL)" has an established customary meaning.

The concept of TTL is straightforward. An optical imaging assembly, such as in a telephoto camera, includes one or more lens elements. As light rays from an object at infinity pass through these lens elements, they become focused at a plane in space. This plane is known as the image plane (or "focal plane"). For example, Figure 3A from the patents-in-suit shows the light rays (diagonal lines) passing through the lens elements and focusing on the image plane.

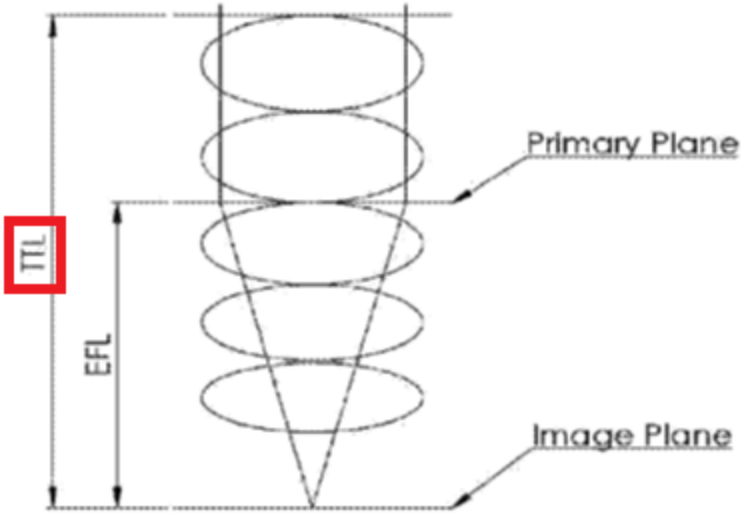


[1] For convenience, this brief cites the '032 patent to represent the shared specification of the '032, '712, '568, and '291 patents.

('712, Figure 3A (partial; color annotations added).) By convention in the field, the "total track length" of the imaging system refers to the distance from the outermost lens surface to the image plane, as annotated in Figure 3A above. As its name indicates, TTL indicates the total length of the optical track: the distance between (1) the plane where incoming light first hits the outermost lens element (*i.e.*, closest to the object of the image) and (2) the plane where the image is focused. Moreover, as shown above, TTL is a characteristic of the collection of optical lens elements, without regard to the location of other components that might exist in an overall imaging system, such as a sensor.

Numerous third-party references dating prior to the patents-in-suit reflect the well-accepted meaning of TTL identified by Apple: the "length from the top of the lens barrel to the image plane, known in the industry as total track length, (TTL)." (Declaration of Lowell D. Mead ("Mead Decl."), Ex. 1 (Bareau & Clark, "The Optics of Miniature Digital Camera Modules") (emphasis added) at 1.) *See also*, *e.g.*, Mead Decl. Ex. 2 at col. 2:6-14 (defining "total track length (TTL)" as "a distance from the position of the object-side surface of the first lens element on the optical axis to the image plane") (emphasis added); Mead Decl. Ex. 3 at col. 2:11-12, 2:34-35 ("total track length (TTL) from the first surface to an image plane") (emphasis added).)

Corephotonics itself also uses this same meaning of TTL. For example, in the figure below from a Corephotonics patent application, the total track length (TTL) is labeled in an imaging assembly with five lens elements:



(Dkt. 96-1 at 13 (Fig. 1) (red box annotation added).) As indicated in the figure, "TTL" refers to the length between the object-side surface of the first lens element and the image plane. Corephotonics' proposed definition for this litigation ignores its own standard usage and should be rejected.

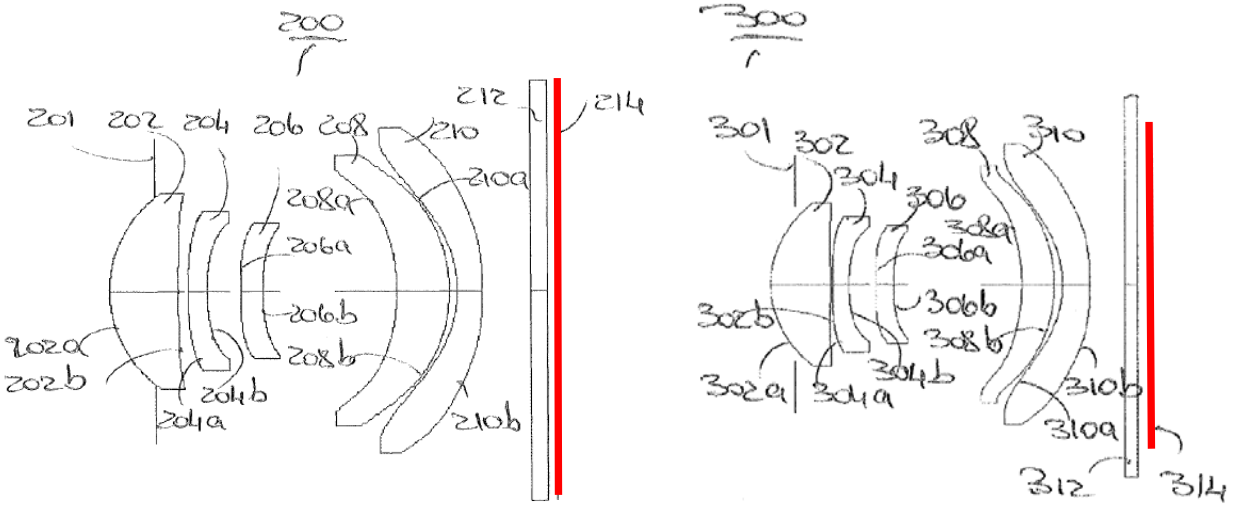
The term TTL is used extensively in Corephotonics' claims in comparison to the focal length of the lens assembly, called the "effective focal length (EFL)." (*Cf.* Open. Br. at 2, 9 (discussing that the '032, '568, and '291 patents describe and claim lenses with TTL less than EFL, i.e., a ratio of TTL/EFL < 1.0).) This ratio of TTL/EFL is known as the "telephoto ratio." The use of "TTL" in this ratio – the total length – is well-known in the field, consistent with Apple's construction. *See, e.g.,* Mead Decl. Ex. 4 (Kingslake, "A History of the Photographic Lens") (1989) at 132 ("A much more meaningful expression is the ratio of the total length from the front lens vertex to the focal plane to the [effective] focal length. This ratio is now universally employed; it is known as the telephoto ratio of the lens.") (emphasis added); Mead Decl. Ex. 5 (Cox, "System of Optical Design") (1964) at 455 ("The ratio of this distance, from the front vertex to the focal plane, to the equivalent focal length, is known as the 'telephoto ratio.'") (emphasis added); Mead Decl. Ex. 6 (Malacara, "Handbook of Lens Design") (1994) at 385 ("[In a telephoto lens, t]he effective focal length of the system is larger than the total length, from the front lens to the focal plane, of the system.") (emphasis added).

2. The patents-in-suit use the same established customary meaning.

The patents-in-suit use the same customary meaning that was known in the industry, and used by Corephotonics. The Background section of the specification first introduces the term without any re-definition: "Cameras in cellphone devices in particular require a compact imaging lens system for good quality imaging and with a small total track length (TTL)." ('032, col. 1:27-30 (emphasis added).) The specification thereby uses this term according to its established, pre-existing meaning.

The embodiments disclosed in the specification use the same meaning. Critically, two of the three detailed embodiments do not include any sensor, and they include TTL values to identify the total track length to the image plane. These two embodiments are illustrated in Figures 2A and 3A of the common specification. These embodiments include an "image plane" (items **214** and **314** respectively) that is used to determine TTL. ('032, Figs. 2A (image plane **214**), 3A (image plane **314**), col. 5:10-11 ("image plane **214** for image formation of an object"), 6:27-28 ("image plane **314** for

image formation of an object").) Figures 2A and 3A, reproduced below, both show the image planes, **214** and **314** respectively, to the far right.



('032, Figs. 2A and 3A (excerpt) (red annotations identifying image planes **214** and **314** added).)

These two embodiments also include a value for TTL. ('032, col. 5:50-52 ("Embodiment **200** provides . . . TTL=5.90 mm"), 7:15-17 ("Embodiment **300** provides . . . TTL=5.904 mm").) The TTL is determined with reference to the image plane (items **214** and **314**) consistent with the customary meaning of TTL. These embodiments do not include any sensor. Rather, the values of TTL are a distance from the first lens element to the image plane, as the PTAB recognized. IPR 2018-01140, Institution Decision, at 11 ("In the specification of the '032 Patent, the TTL of each lens system embodiment can be determined by summing the widths of lens elements and spacing between lens elements of the lens system from the object side of the first lens to the image plane.") (citations omitted). Therefore, the term "total track length (TTL)" as used in these patents is not, and cannot be, limited to something that references a sensor, as it would exclude these embodiments.

A "claim construction that excludes a preferred embodiment . . . is rarely, if ever correct and would require highly persuasive evidentiary support." *EPOS Techs. Ltd. v. Pegasus Techs. Ltd.*, 766 F.3d 1338, 1347 (Fed. Cir. 2014) (internal quotation and citation omitted) (reversing district court's ruling because the "the district court's construction reads out preferred embodiments and it is not supported by 'highly persuasive' evidence"). There is no such "highly persuasive" evidence here.

Like the embodiments described above, most of the claims at issue are directed to the collection of lenses and do not recite a sensor. The claims of the '032, '712, and '568 patents recite a "lens assembly," that includes "a plurality of . . . lens elements" with a total track length (TTL), with no recitation of any sensor. (*See* '032, claim 1, 1:42-54 (explaining that a "lens assembly" is made up of lens elements); '712, claims 1, 15, 19; '568 patent, claim 1.) These claims are not directed to a "lens system" that requires a sensor. ('032, 1:55-59.)

Similarly, '291 patent dependent claim 6 recites TTL as a characteristic of a Tele lens: "the Tele lens includes a ratio of total length (TTL)/effective focal length (EFL) . . .." ('291, claim 6.) The TTL is a feature of the *lens*, not a characteristic of a sensor. (*See* '291, independent claim 1 (claiming the Tele lens and Tele sensor separately), Figure 1, 6:5-7.) The claims thus use the term "total track length (TTL)" with its customary meaning: the length on an optical axis between the object-side surface of the first lens element and the image plane.

3. The patents-in-suit do not clearly re-define "total track length (TTL)."

Corephotonics contends that a single statement regarding "the electronic sensor" in the specification's Summary section constitutes a re-definition of the term "total track length (TTL)." (Open. Br. at 9-10.) Corephotonics is incorrect.

As Corephotonics itself emphasizes, "[t]he standards for finding lexicography and disavowal are *exacting*." (Open Br. at 12, quoting *GE Lighting*, 750 F.3d at 1309 (emphasis by Corephotonics).) The Federal Circuit applies "a 'heavy presumption' that a claim term carries its ordinary and customary meaning." *Starhome GmbH v. AT & T Mobility LLC*, 743 F.3d 849, 857 (Fed. Cir. 2014) (citation omitted). "A claim term should be given its ordinary meaning in the pertinent context, unless the patentee has made clear its adoption of a different definition or otherwise disclaimed that meaning." *Ancora Techs., Inc. v. Apple Inc.*, 744 F.3d 732, 734 (Fed. Cir. 2014).

"To act as its own lexicographer, a patentee must 'clearly set forth a definition of the disputed claim term,' and 'clearly express an intent to define the term.'" *GE Lighting*, 750 F.3d at 1309 (citation omitted). "The patentee's lexicography must, of course, appear with reasonable clarity, deliberateness, and precision before it can affect the claim." *Merck & Co., Inc. v. Teva Pharm. USA, Inc.*, 395 F.3d 1364, 1370 (Fed. Cir. 2005) (internal quotation and citations omitted).

Corephotonics fails to overcome the heavy presumption that the term "total track length (TTL)" is used according to its customary meaning. The specification does not re-define the term, such as by stating "as used herein, the term 'total track length (TTL)' means . . ." or the like. On the contrary, as noted above, the specification introduces the term in its Background section without any re-definition. ('032, col. 1:27-30.) The patent thus simply uses the pre-existing, established meaning of "total track length (TTL)." The same meaning is used throughout the patent, including in the detailed preferred embodiments that do not include any sensors, as discussed previously.

Corephotonics' proposed construction would impermissibly read in a sensor limitation from a single sentence regarding a single embodiment (among many). In the sentence from the Summary section that Corephotonics relies upon, the broader context is describing an embodiment that "may" include (but does not require) a sensor that coincides with an image plane. ('032, col. 1:55-63.) That sentence does not require limiting the claims to that single embodiment in the manner that Corephotonics proposes. Rather, that sentence, when read in context (as it must be), is fully consistent with the customary meaning of "total track length (TTL)" in reference to the image plane. The Summary section starts by describing that "[e]mbodiments disclosed herein . . ." may have various features. ('032, col. 1:42-54.) For example, an embodiment "*may*" include various elements including "an image sensor with an image plane on which an image of the object is formed." (*Id*., col. 1:55-59 (emphasis added).) Thus, in an example embodiment, the image plane may coincide with the surface of an image sensor. The next sentence states: "The effective focal length of the lens assembly is marked 'EFL' and the total track length on an optical axis between the object-side surface of the first lens element and the electronic sensor is marked 'TTL'." (*Id*., col. 1:60-63.) Therefore, in this exemplary embodiment, a marking of "TTL" identifies the total track length from the object-side surface to "the" previously-referenced sensor. This statement does not redefine the term "total track length (TTL)" for purposes of the entire patent. This statement simply notes that, in an example embodiment where the image plane coincides with a sensor surface, the "total track length" is "marked" with the label "TTL." Thus, the use of TTL in this embodiment is consistent with the customary meaning. In this embodiment, the image plane coincides with the surface of a sensor, as

noted previously. Thus, the "TTL" marking identifies the length on an optical axis between the object-side surface of the first lens element and the image plane.[2]

Corephotonics' construction also makes no sense in the context of the claim language. Most of the claims at issue do not recite a sensor, as noted previously. These claims are agnostic as to the existence or non-existence of a sensor to accompany the lens assembly and its image plane. Corephotonics' construction, injecting a reference to "the electronic sensor" when the claims do not recite any sensor, would render these claims nonsensical.

4. Corephotonics' remaining arguments are unavailing.

Corephotonics raises several other arguments, none of which change the result. (Open. Br. at 10-11.) First, it argues that Apple's construction "deviates from the plain text in the specification." (*Id*. at 10.) Again, Corephotonics is incorrect. Before these patents were filed, "total track length" had a well-established meaning in the field, just like many other technical terms-of-art that have established meanings. When these patents were filed, the specification assumed that same meaning, starting with the Background section and continuing through the descriptions of the preferred embodiments. The only specification text that Corephotonics relies upon locates the sensor at the image plane, so is consistent with Apple's proposal.

Next, Corephotonics notes that the specification separately refers to the "image plane" and the "image sensor." (Open. Br. at 10.) That, however, only supports Apple's proposed construction. As discussed above, the specification consistently uses the term TTL to refer to the distance to the image plane. In one optional embodiment, an image sensor may be located at the image plane. Other embodiments, however, do not include a sensor, and neither the claims at issue nor the specification require an image sensor to be located at the image plane. It therefore would be improper to adopt a construction that would import a requirement into all of the claims for an "electronic sensor" which

[2] The same observations hold true for the first of the patents' three detailed embodiments, shown in Figure 1A. That embodiment includes an "image plane **114** for image formation of an object." ('032, col. 3:10-13.) In that embodiment, in addition to the image plane, "an image sensor (not shown) is disposed at image plane **114** for the image formation." (*Id*., col. 3:13-15.) In addition, as the PTAB recognized, the TTL in the first embodiment can be computed as the sum of the distances from the first lens element to the image plane. IPR 2018-01140, Institution Decision, at 11.

appears in only one optional embodiment but not others.

Corephotonics further argues that extrinsic evidence is "less significant" than the intrinsic record. (*Id*. at 10.) But the intrinsic evidence—the specification and claims—use the term-of-art "total track length (TTL)" according to its established meaning, as discussed previously, including in the embodiments that have TTL and an image plane but do not include any sensor. The Supreme Court and Federal Circuit have repeatedly affirmed that a district court may properly consult extrinsic sources to determine the customary meaning of a technical term-of-art. *Teva Pharm. USA, Inc. v. Sandoz, Inc.*, 135 S. Ct. 831, 841 (2015) (in some cases "the district court will need to look beyond the patent's intrinsic evidence and to consult extrinsic evidence in order to understand . . . the meaning of a term in the relevant art during the relevant time period."); *Starhome*, 743 F.3d at 856 (noting that extrinsic references "can often be useful in claim construction, particularly insofar as they help the court 'to better understand the underlying technology and the way in which one of skill in the art might use the claim terms.'") (quoting *Phillips v. AWH Corp.*, 415 F.3d 1303 1318 (Fed. Cir. 2005) (en banc)); *Helmsderfer v. Bobrick Washroom Equip., Inc.*, 527 F.3d 1379, 1382 (Fed. Cir. 2008) ("A court may look to extrinsic evidence so long as the extrinsic evidence does not contradict the meaning otherwise apparent from the intrinsic record.").

In *Starhome*, for example, the Court cited extrinsic evidence to determine that "[t]he term 'gateway' had a well-understood meaning in the art" and found that "[c]onsidering 'gateway' in the context of the claims and specification of the '487 patent, one of ordinary skill would have understood that the inventors did not depart from the ordinary meaning of 'gateway' with their use of the term 'intelligent gateway.'" 743 F.3d at 856-57. Likewise here, the extrinsic evidence and the intrinsic evidence align with the same meaning of "total track length (TTL)," as discussed previously.

Corephotonics next argues that the extrinsic evidence "presents a contradictory record." (Open. Br. at 10.) That is incorrect. Corephotonics cites two prior art patents, both to the same assignee, with discussions that are notably similar to the statements in the later-filed Corephotonics specifications. (*Id*. at 10-11, citing U.S. 8,310,768 at 2:8-10, 3:48-51; U.S. 8,395,851 at 1:66-2:1, 2:20-23.) Those specifications, like the derivative later-filed Corephotonics specification, describe embodiments where the image plane coincides with a sensor. ('851, col. 1:60-2:2 (describing

embodiment with "an electronic sensor disposed at an image plane for the image formation of the object" and then identifying TTL with reference to "the" sensor) (emphasis added); '768, col. 7:37-39 ("image plane" in first embodiment), 8:45-53 (TTL in first embodiment), 9:27-29 ("image plane" in second embodiment), 10:23-30 (TTL in second embodiment).) Their discussion that "TTL" indicates distance to "the" sensor in such embodiments therefore applies the customary meaning known in the field, just like the Corephotonics embodiment. Likewise, the Corephotonics patent application that discusses TTL refers to the "image sensor plane," again reflecting that is the image plane—which may or may not coincide with a sensor—that defines TTL. (Open. Br. at 11, citing Ex. 1 at COREPH000961 (emphasis added).)

Moreover, regardless of whether some third-party implementations might use the term "TTL" with reference to a sensor, the fact remains that defining "total track length" with reference to "the electronic sensor" for the Corephotonics patents-in-suit would impermissibly exclude preferred embodiments that do not include a sensor, and would also render nonsensical the claims that do not recite any sensor, as discussed previously. Only Apple's proposed construction consistently reflects the customary usage of "total track length (TTL)" throughout the specification and the claims, and in the industry.

B. "standard color filter array (CFA)" ('152 patent, claims 1, 3)

Corephotonics' Proposal	Apple's Proposal
a color filter array (CFA) that includes a RGB (Bayer) pattern or a non-Bayer pattern such as RGBE, CYYM, CYGM, RGBW#1, RGBW#2 or RGBW#3	a color filter array (CFA) including a RGB (Bayer) pattern, RGBE, CYYM, CYGM, RGBW#1, RGBW#2, or RGBW#3

The '152 patent specification provides a list of patterns used by a "standard CFA" (color filter array) and defines that a CFA that uses any other pattern is a "non-standard CFA." The sole issue in dispute is whether the claimed "standard" CFA is (1) limited to CFAs using the patterns the specification identifies for a "standard CFA" as opposed to patterns used by a "non-standard CFA," as Apple proposes, or (2) encompasses CFAs using any possible pattern, including the CFA patterns the specification identifies for a "non-standard CFA," as Corephotonics proposes.

Apple's construction properly captures the meaning of a "standard CFA," in contrast with a "non-standard CFA," as taught by the specification. The meaning flows from the following passage of the specification. The specification distinguishes "standard" CFAs from "non-standard" CFAs based on the patterns that fit into each category:

> A "standard CFA" may include a RGB (Bayer) pattern or a non-Bayer pattern such as RGBE, CYYM, CYGM, RGBW#1, RGBW#2 or RGBW#3. Thus, reference may be made to "standard Bayer" or "standard non-Bayer" patterns or filters. As used herein, "non-standard CFA" refers to a CFA that is different in its pattern that [sic] CFAs listed above as "standard". Exemplary nonstandard CFA patterns may include repetitions of a 2x2 micro-cell in which the color filter order is RR-BB, RB-BR or YC-CY where Y= Yellow = Green + Red, C = Cyan = Green + Blue; repetitions of a 3x3 micro-cell in which the color filter order is GBR-RGB-BRG; [etc.].

('152, col. 2:43-63 (emphasis added).) Thus, a "standard CFA" has one of the patterns "listed above" in this passage: RGB (Bayer), RGBE, CYYM, CYGM, RGBW#1, RGBW#2 or RGBW#3. The passage states that any patterns other than those specific listed patterns are "nonstandard" patterns defining a "non-standard CFA." (*Id.*) The passage further provides a few specific examples of non-standard CFA patterns, such as RR-BB, RB-BR, etc. (*Id.*)

Corephotonics erroneously proposes a construction that would effectively delete the word "standard" out of the phrase "standard color filter array (CFA)." *Pause Tech., LLC v. TiVo, Inc.*, 419 F.3d 1326, 1334 (Fed. Cir. 2005) ("In construing claims, however, we must give each claim term the respect that it is due."); *Merck*, 395 F.3d at 1372 (a "claim construction that gives meaning to all the terms of the claim is preferred over one that does not do so.") (citations omitted). Corephotonics' proposed construction is essentially "a CFA that includes either an X pattern or a non-X pattern"—in other words, a CFA that includes any possible pattern. Corephotonics' proposed construction would incorrectly encompass CFAs using any possible pattern, including the exemplary patterns that the specification specifically identifies as "nonstandard CFA patterns" as opposed to "standard" patterns. ('152, col. 2:43-63.)

Corephotonics appears to contend that the first sentence in the above-quoted passage should be read by itself in isolation as an explicit, exhaustive definition of the term "standard CFA": "A 'standard CFA' may include a RGB (Bayer) pattern or a non-Bayer pattern such as RGBE, CYYM,

CYGM, RGBW#1, RGBW#2 or RGBW#3." (*See* Open. Br. at 11-12, quoting '152, col. 2:43-49 (emphasis added).) But that sentence alone does not provide the complete lexicographic definition of the term under the Federal Circuit's exacting standards. While the first sentence notes that a standard CFA "may include" the listed patterns, the immediately following sentences proceed to confirm that, for purposes of the patent, the specific patterns "listed above" are the "standard" CFA patterns as opposed to patterns for a "non-standard CFA." Corephotonics' construction, which would encompass non-standard CFAs, ignores the context of the sentence that it cites and is contrary to the specification's express disclosure.

C. "to register the overlap area . . ." claim language ('152 patent, claims 1, 3)

Corephotonics proposes to construe a lengthy block of claim language with an even lengthier construction, which would be unhelpful to and further confuse the jury. (Open. Br. at 13-15.) Corephotonics proposes to construe the following language: "to register the overlap area of the second image as non-primary image to the first image as primary image *to obtain the output image*." As discussed further below, there is no material dispute on the majority of the claim language at issue. The parties do not dispute, for example, that "to register" refers to the function of "registering" two images, which is one part of the process used to "obtain the output image," as described in various embodiments. (*See, e.g.,* '152, col. 3:37-4:50, col. 9:12-45, Figure 10.) The principal issue in dispute is Corephotonics' attempt to rewrite the phrase "to obtain the output image," which can readily be understood by the jury without need for further construction, into an unduly narrow construction that is not supported by the evidence. As discussed further below, Corephotonics' proposed construction improperly reads into the claim phrase "to obtain the output image" a particular way of forming an output image that is nowhere in the claims. The Court should reject Corephotonics' proposal.

For ease of reference, the disputed claim language that Corephotonics seeks to construe is addressed in two parts below.

1. "to register the overlap area of the second image as non-primary image to the first image as primary image"

Corephotonics' Proposal	Apple's Proposal
to map the overlap area of the second image as the non-primary image to first image as the	to map the overlap area of the second image as the non-primary image to the first image as the

primary image, finding correspondences between the pixels in the two images for the overlap area	primary image, **by** finding correspondences between the pixels in the two images for the overlap area

With respect to most of the claim language at issue, Corephotonics does not dispute that Apple's proposed construction accurately captures the meaning of the registration function. The only difference between the parties' proposals is that Corephotonics' construction does not include the word "by," as emphasized above. By leaving out this word, Corephotonics' construction is ambiguous as to whether "finding correspondences . . ." occurs as a *part of* the mapping function, which is the correct meaning, or as a *separate* function. The specification passage relied on by both Corephotonics and Apple teaches that finding correspondences occurs as a *part of* registration (mapping). (Open. Br. at 14 (quoting '152, 8:2-4) ("In step 1002, the Tele image is registered (mapped) into the Wide image. The mapping includes finding correspondences between pixels in the two images.") (emphasis added).)

Given that both parties' constructions rely on the specification's teaching that "mapping *includes* finding correspondences," there might be no dispute that the "finding correspondences" takes place as part of the mapping. However, to the extent Corephotonics' proposal seeks to omit the fact that "finding correspondences" occurs as *part of* mapping, it is contrary to the specification's teaching and should be rejected.[3]

2. ". . . to obtain the output image"

Corephotonics' Proposal	Apple's Proposal
to form the output image **using information from the non-primary and primary images together with the mapping information of the non-primary image to the primary image for the overlap area**	No construction necessary

The final portion of the disputed phrase – "to obtain the output image" – merely states the objective of the registration function: the registration function is performed in order to obtain an output image. This straightforward language does not require separate construction.

[3] Alternatively, the word "by" in Apple's construction could be replaced with the word "including."

It is well-settled that claim language is construed to have its "ordinary and customary meaning" with only two exceptions: "1) when a patentee sets out a definition and acts as his own lexicographer, or 2) when the patentee disavows the full scope of a claim term either in the specification or during prosecution." *Thorner v. Sony Comput. Entm't Am. LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012) (citation omitted). "Both exceptions require a clear and explicit statement by the patentee." *Id*. at 1367-68 (citation omitted). Neither exist here for this simple language.

Nothing in the intrinsic record re-defines this ordinary language or disclaims its plain and ordinary meaning. Exemplary embodiments in the specification describe that registration is performed as one step to obtain the output image, just as the claim language recites, while other steps generate the output image. ('152, Fig. 10 (showing step **1002** for mapping/registration followed by another step **1004** for forming the output image); col. 9:12-45 (describing methods for registration); 9:46-10:14 (describing various exemplary processes performed after registration, in which "portions of the registered Wide and Tele images are used to generate the output image").) In defending its attempt to inject narrowing limitations, Corephotonics mischaracterizes Apple's position. (Open. Br. at 13-14.) Apple does not propose to delete the words "to obtain the output image" out of the claims. Nor does Apple propose that those words have no meaning. Instead, Apple notes that these simple words retain their plain meaning, do not necessitate reading additional limitations from the specification into the claim, and need not be complicated to confuse the jury. *O2 Micro Int'l Ltd. v. Beyond Innovation Tech. Co., Ltd.*, 521 F.3d 1351, 1362 (Fed. Cir. 2008) ("district courts are not (and should not be) required to construe every limitation present in a patent's asserted claims."); *NTP, Inc. v. Research in Motion, Ltd.*, 418 F.3d 1282, 1311 (Fed. Cir. 2005) ("Claim construction is a matter of resolution of disputed meanings and technical scope, to clarify and when necessary to explain what the patentee covered by the claims, for use in the determination of infringement. It is not an obligatory exercise in redundancy.") (internal quotation and citation omitted); *Bd. of Trs. of Leland Stanford Jr. Univ. v. Roche Molecular Sys., Inc.*, 528 F. Supp. 2d 967, 976 (N.D. Cal. 2007) ("terms do not need to be construed" where they are "neither unfamiliar to the jury, confusing to the jury, nor affected by the specification or prosecution history.").

In its brief, Corephotonics does not argue, let alone demonstrate, that the specification contains any disclaimer or redefinition that requires a lengthy injection of narrowing features into the claims. *Thorner*, 669 F.3d at 1365-67. Corephotonics merely discusses an example embodiment and invites the Court to commit "one of the cardinal sins of patent law – reading a limitation from the written description into the claims." *Phillips*, 415 F.3d at 1320 (citation omitted). The Court should decline the invitation to err.

Corephotonics also argues that the "context of the claim as a whole" somehow requires the Court to rewrite the simple phrase "to obtain the output image" into a 30-word mouthful. (Open. Br. at 14.) But Corephotonics fails to demonstrate that the surrounding claim language purportedly requires Corephotonics' lengthy proposed rewrite to read into the claims an unclaimed extra step requiring a particular way of forming an image. *Helmsderfer*, 527 F.3d at 1383 ("Courts do not rewrite claims; instead, we give effect to the terms chosen by the patentee.") (internal quotation and citation omitted).

Specifically, Corephotonics attempts to inject a new functional limitation on how an image is formed into its proposed construction of a claim limitation directed to a different function. (Open. Br. at 14.) The claims at issue recite two functions: (1) "to provide an output image …" and (2) "to register … ." ('152, claims 1(c) and 3(c)-(d).) The first function is directed to providing an output image, and the second function is directed to a registration function. A stated objective of the (second) registration function is "to obtain the output image" provided by the (first) providing function. No separate construction of this objective is required. Neither that statement of the objective of the function, nor anything else in the claim language or specification, requires importing an additional limitation into the claims that limits image formation to the specific manner specified in Corephotonics' proposed construction (namely, "using information from the non-primary and primary images together with the mapping information of the non-primary image to the primary image for the overlap area"). The claimed registration function is just that, a function of registration, with a stated objective: to obtain the output image. The claim language does not recite or require additional narrow limitations detailing specifically *how* the image must be formed after the registration as Corephotonics seeks to inject into the claims.

D. "fused output image of the object or scene from a particular point of view" ('291 patent, claims 1, 12)

Corephotonics' Proposal	Apple's Proposal
"output image of the object or scene from a particular point of view" means that "the object and scenes of the output image have the position and shape as would be seen from a defined point of view of one of the Wide or Tele lens" "a fused output image of an object or scene from a particular point of view" means "an output image that: if from the Wide point of view (POV), combines wide image data and that tele image data that corresponds to wide image data, such that the object or scenes of the output image have the position and shape as would be seen from the Wide lens, if from the Tele POV, combines tele image data and that wide image data that corresponds to tele image data, such that the object or scenes of the output image have the position and shape as would be seen from the Tele lens"	an output image of an object or scene, that, whether from the Wide or Tele point of view, includes both Wide and Tele image data

Apple's proposal succinctly captures the meaning of the claim language. In fact, most of Apple's proposed construction is materially undisputed. The parties agree that the terms "output image," "object," and "scene" do not require construction, as both parties' constructions include those same words without construing them. The parties also agree that in the context of the claims and specification, a "fused" output image includes both Wide and Tele image data—that is, a fused image includes data from a Wide point of view and data from a Tele point of view. (*See* '291, col. 3:36-38, 5:5-11, 9:34-36, 9:52-10:10, Figure 5; *see also* Open. Br. at 16 ("The specification of the '291 patent goes on to teach methods for generating fused output images … from the information in the Wide and Tele camera images."), Corephotonics' proposed construction ("an output image that: if from the Wide point of view (POV), combines wide image data and that tele image data … , if from the Tele POV, combines tele image data and that wide image data …") (emphasis added).) Corephotonics' brief does not argue that there is anything incorrect about the portion of Apple's construction that addresses the "fused output image of the object or scene" claim language. (*Cf.* Open. Br. at 15-16.)

The only remaining disputed claim language is ". . . from a particular point of view." These are plain English words used according to their ordinary meanings. In context, the claims contemplate two different points of view: the Wide point of view or the Tele point of view. (*See* '291 claims 1 and 12 (reciting "Wide" and "Tele" fields of view).) Corephotonics agrees, in its proposed construction, that "the Wide point of view" and "the Tele point of view" are the two applicable points of view in these claims. Apple's proposed construction similarly captures the relevant meaning of ". . . from a particular point of view" in the context of the claims: the output image is fused whether from the Wide point of view or from the Tele point of view.

Corephotonics argues that Apple's construction allegedly "fails to explain what is meant by" the claimed "particular point of view." (Open. Br. at 15-16.) But Apple's construction fully addresses this claim language. As discussed previously, the claims at issue recite two points of view: Wide and Tele. Apple's construction reflects that the fused output image is from a particular point of view (*i.e.*, from the Wide or Tele point of view). Nothing more is required.

Corephotonics also argues that the specification contains a narrower "definition" of "point of view (POV)." (Open. Br. at 15.) But its argument misses the mark for at least two reasons. First, the specification does not provide any such definition. The specification merely discusses the fact that when a given object is seen from two different sub-cameras the object will appear differently, which "is referred to as point-of-view (POV)." ('291, col. 4:60-63.) This discussion is not a lexicographic definition of the term "point of view." The fact that objects appear differently from different points of view is merely an observed effect of having different points of view, not a strict definition of the meaning of "point of view" itself.

Moreover, Corephotonics does not capture any purported definition of "point of view" in its proposed construction. Its proposed construction merely repeats the claim language "point of view" without defining that term. Thus, both parties agree that the term "point of view" itself does not require construction.

Beyond that, Corephotonics makes no effort to show why the Court should accept the lengthy proposals that Corephotonics would inject into the claim language. Nothing in the intrinsic evidence

requires such prolix, narrow constructions for the straightforward language at issue, either through disclaimers or re-definitions. *Thorner*, 669 F.3d at 1365-67.

E. "sensor oversampling ratio" ('291 patent, claims 4, 5, 13)

Corephotonics' Proposal	Apple's Proposal
the ratio of the in-line (i.e. in a line) number of sensor pixels and in-line number of output video format pixels	no construction is necessary, but if the Court determines construction is required, Apple would propose: "the ratio of the in-line (i.e. in a line) number of sensor pixels **in the Wide sensor** to the in-line number of output video format pixels"

Corephotonics does not demonstrate any reason why this claim language needs to be construed. The term is recited only in dependent claims, and Corephotonics does not indicate that any issue of validity or infringement turns on this term. *NTP*, 418 F.3d at 1311 ("Claim construction is a matter of resolution of disputed meanings and technical scope, to clarify and when necessary to explain what the patentee covered by the claims, for use in the determination of infringement.") (internal quotation and citation omitted).

To the extent the Court elects to construe this term at this time, this is in fact the one instance at issue where Corephotonics' specification *does* provide an explicit definition. The specification states: "PL_{Wide} and PL_{video}, refer respectively to the 'in-line' (i.e. in a line) number of Wide sensor pixels and in-line number of output video format pixels. The ratio PL_{Wide}/PL_{video} is called an 'oversampling ratio.'" ('291, col. 6:58-61 (emphasis added).) This statement defines what is an "oversampling ratio." An oversampling ratio, for purposes of this patent, is the mathematical ratio set forth in the specification: PL_{Wide}/PL_{video}, where PL_{Wide} and PL_{video} refer respectively to the "in-line" (*i.e.*, in a line) number of Wide sensor pixels and in-line number of output video format pixels. (*Id.*) The specification does not provide any contrary description or definition of an "oversampling ratio" beyond this definition.

Apple's proposed construction faithfully captures this mathematical definition verbatim from the specification. Corephotonics' proposal captures most of the specification's definition, thereby conceding that the sole source of meaning for the term "oversampling ratio" is this passage in the

specification. However, Corephotonics improperly deletes out the meaning of "PL_{Wide}" which is "the 'in-line' (i.e. in a line) number of Wide sensor pixels."

Corephotonics fails to demonstrate any support for its erroneous re-crafting of the specification's definition. It argues that the definition is provided as part of describing a preferred embodiment. (Open. Br. at 17.) But the statement itself is definitional: "The ratio PL_{Wide}/PL_{video} is called an 'oversampling ratio.'" ('291, col. 6:58-61.) It is irrelevant that the definition is provided in the context of describing an exemplary embodiment. Of course, the use of an oversampling ratio is merely an optional embodiment of the claimed invention. In fact, the term "oversampling ratio" is recited only in dependent claims. The independent claims can be practiced without using an oversampling ratio. But where the claims recite an "oversampling ratio," the definition of that term is provided by the specification.

Corephotonics further argues that double-dependent claim 5 would be rendered "redundant" if the claimed "sensor oversampling ratio" refers to PL_{Wide}/PL_{video} as the specification defines it. (Open. Br. at 17.) But claim 5 is fully consistent with the specification's definition. In fact, claim 5 only further reinforces the meaning of the term. Claim 5 recites as follows: "5. The camera of claim 4, wherein the Wide and Tele FOVs and the sensor oversampling ratio satisfy the condition $0.8*PL_{Wide}/PL_{video}<Tan(FOV_{Wide})/Tan(FOV_{Tele})<1.2*PL_{Wide}/PL_{video}$, wherein PL_{Wide} is an in-line number of Wide sensor pixels and wherein PL_{video} is an in-line number of output video format pixels." Claim 5 thus recites a certain mathematical condition using the same oversampling ratio introduced in claim 4. However, because claim 4 does not use the terms "PL_{Wide}" and "PL_{video}," the definitions of these terms are spelled out in claim 5. These explanations do not render redundant the term "sensor oversampling ratio," which maintains its same meaning from claim 4.

III. CONCLUSION

For the reasons set forth above, Apple respectfully requests that the Court construe the disputed terms consistent with Apple's proposed constructions.

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